

80386-25/33 MOTHER BOARD USER'S MANUAL

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CHAPTER ONE: INTRODUCTION

1-1 Introduction:

The 386 system main board is based on SOLUTION chipset. It is fully compatible with IBM PC/AT computers. Besides the basic PC/AT functions, this system main board also supports a variety of advanced features including true 32-bit processing capability, 25MHz or 33MHz of system clock rate, total 16M bytes of RAM, page mode interleaved memory architecture, shadow RAM for system and video BIOS, and etc. It can run PC-DOS, MS-DOS, OS/2, UNIX, XENIX, and all the software packages compatible with PC/AT or specially for 386. Based on this 386 system main board, a sophisticated computer system can be built with high speed performances and powerful processing capabilities.

The major features of this 386 system main board are listed below:

- Intel 80386-33 or 80386-25 CPU running at 33MHz or 25MHz.
- Socket for Intel 80387 and Weitek 3167 math coprocessor.
- Page mode interleaved memory architecture.
- SIMM RAM modules for maximum 8M bytes R_{AM} on board.
- Size of main memory up to 16M bytes with memory expansion card.
- Shadow RAM for system and video BIOS.
- Turbo/normal system speed switchable by hardware and software.
- Advanced BIOS with system setup process.
- CMOS memory for system configuration data.
- 7-channel DMA.
- 16-level interrupts.
- Seven 16-bit and one 8-bit I/O slots.
- One 32-bit memory expansion slot.

CHAPTER TWO: INSTALLATION

2-1 Installation Guide

2-1.1 Peripherals Required

1. PC/AT compatible system chassis.
2. Standard PC/AT compatible keyboard.
3. Standard PC/AT compatible power supply.
4. Display card.
5. Monitor.
6. Floppy and/or hard disk drive controller.
7. Floppy and/or hard disk drives.
8. Any other PC/AT compatible equipments such as serial port, parallel port, mouse, printer, LAN card, and etc.

2-1.2 Installation Procedures

1. Set all the necessary jumpers as per desired system configuration (Please refer to Section 2-2 Jumpers and Connectors).
2. Fix the system main board to the case.
3. Install RAM modules.
4. Connect the power supply to the system main board.
5. Install floppy disk drive and/or hard disk drive with controller.
6. Plug in keyboard.
7. Install display card.
8. Select display mode (mono/color).
9. Connect keylock, speaker, power on LED, turbo switch, turbo LED, and reset switch to the front panel of the case.
10. Connect monitor to the display card.
11. Check all screws and make sure that all parts are

properly fixed.

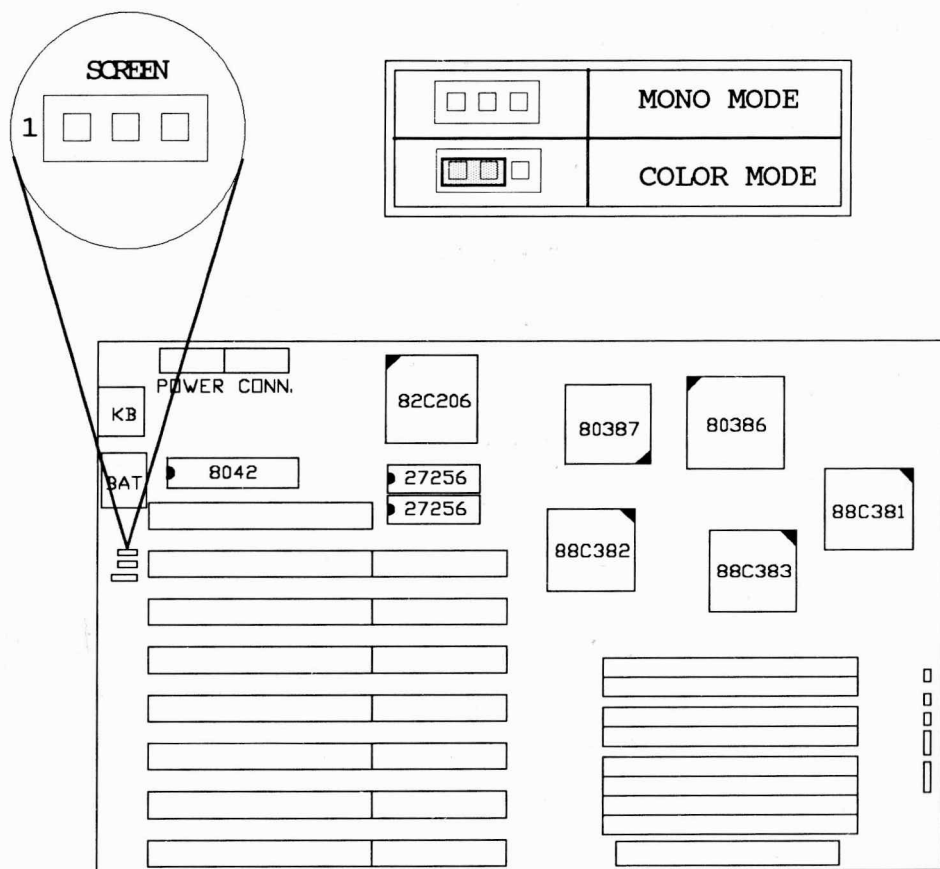
12. Switch on the monitor and the power supply.

13. Run the setup program as per Chapter Three if the system is newly setup or the configuration is to be changed.

2-2 Jumpers and Connectors

2-2.1 Display Adapter Setup Jumper (SCREEN)

The jumper SCREEN is for the display function selection. Open pin 1 and pin 2 whenever a monochrome display card is installed. Short pin 1 and pin 2 whenever a color display card is installed. Please refer to Figure 2-1 for the location of SCREEN.



■ Fig.2-1 JP1 location

2-2.2 Keylock & Power-On LED Connector (KEYLOCK)

The connector KEYLOCK is for keylock circuit to enable or disable the keyboard and for the power-on LED on the case. It connects to the keyboard lock and power-on LED on the front panel of the case. The power-on LED will light up whenever the system power is on. Also the keyboard lock on the case can enable or disable the keyboard. Please refer to Figure 2-2 for the location.

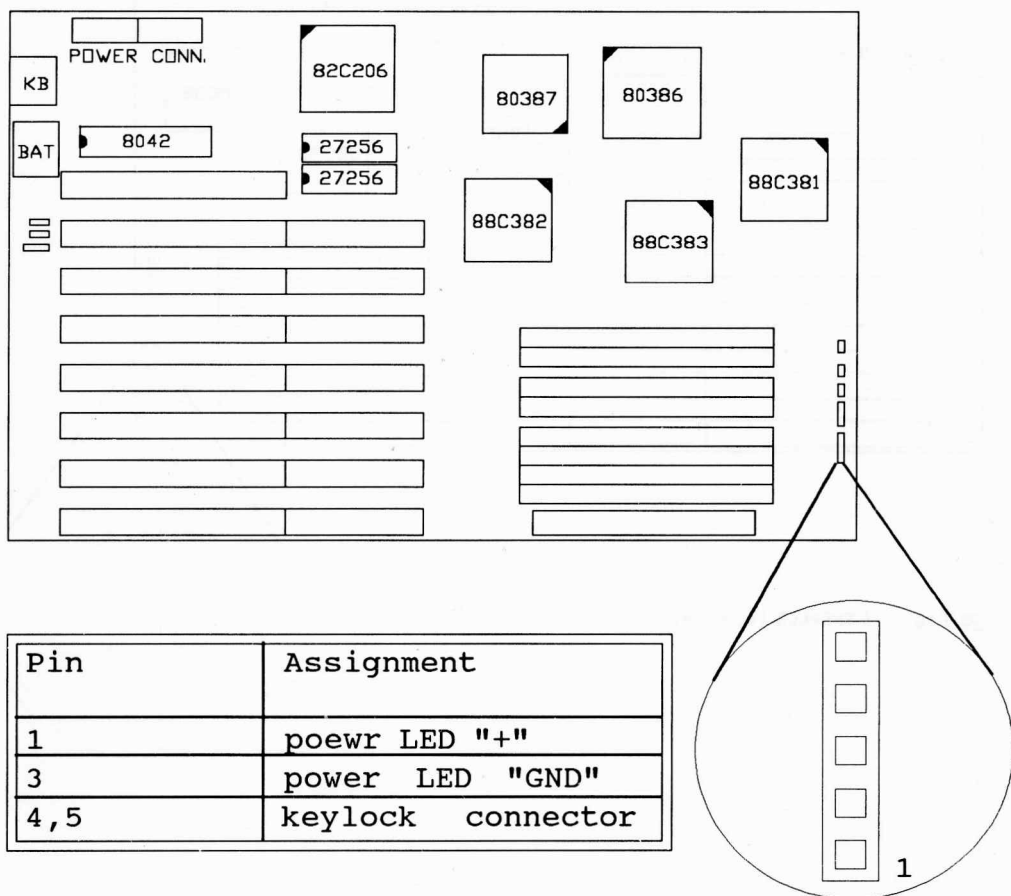
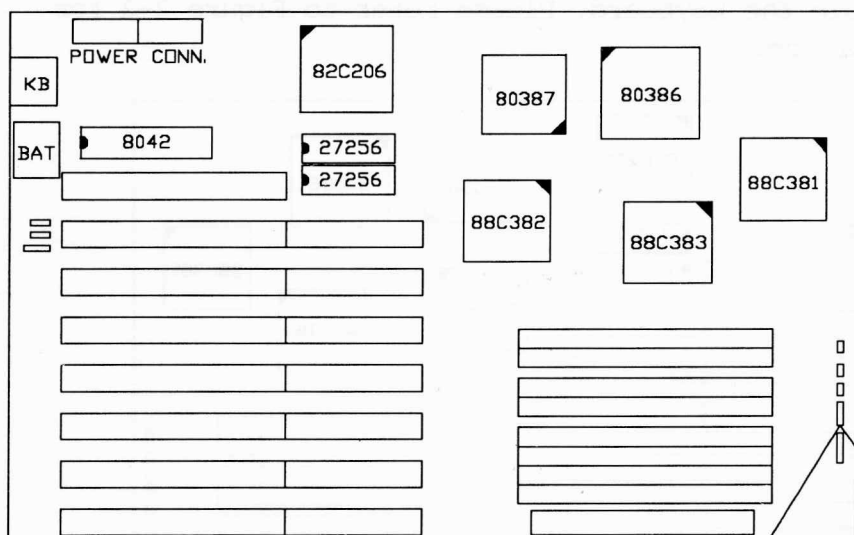


Fig. 2-2 KEYLOCK location

2-2.3 Speaker Connector (SPEAKER)

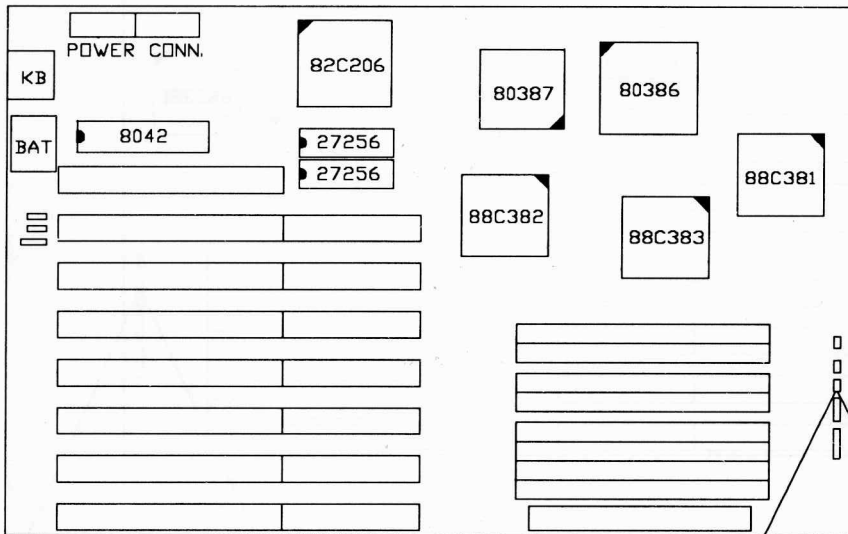
SPEAKER is for audio output. Connect the speaker on the case to the connector labeled "SPEAKER". Please refer to Figure 2-3 for the location.



■ Fig. 2-3 SPEAKER location

2-2.4 Reset Switch Connector (RESETSW)

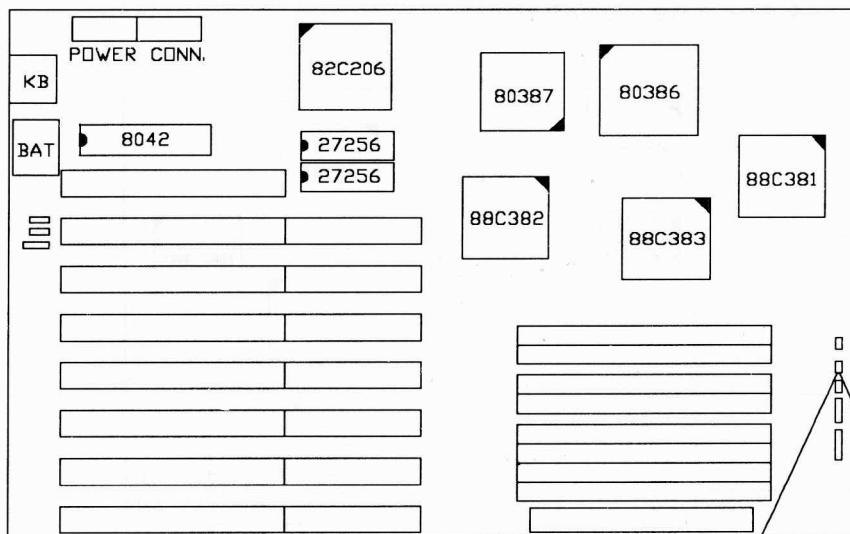
RESETSW is a reset switch connector. Connect RESETSW to the reset button on the front panel of the case. Whenever the reset button is pressed, the system will be restarted. This is a hardware reset step similar to the power-on function. Please refer to Figure 2-4 for the location.



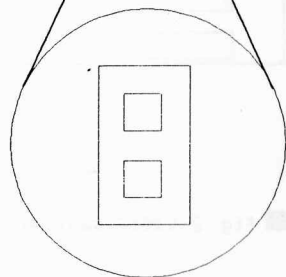
■ Fig. 2-4 RESETSW location

2-2.5 Turbo Switch Connector (TURBOSW)

TURBOSW is a turbo/normal switch to select system processor clock rate. Connect TURBOSW to the turbo switch on the front panel of the case in order to select turbo and normal speed. Please refer to Figure 2-5 for the location.

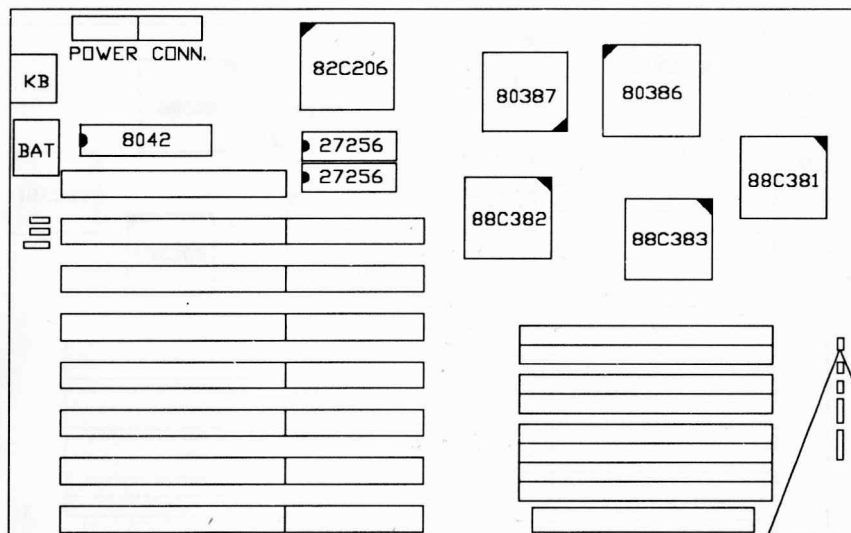


■ Fig. 2-5 TURBOSW location

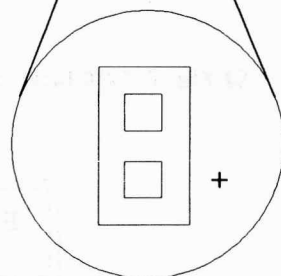


2-2.6 Turbo LED Connector (TURBOLED)

TURBOLED is a turbo LED connector. Connect TURBOLED to the turbo LED on the front panel on the case. The turbo LED will light up whenever the system is in turbo mode. Please refer to Figure 2-6 for the location.

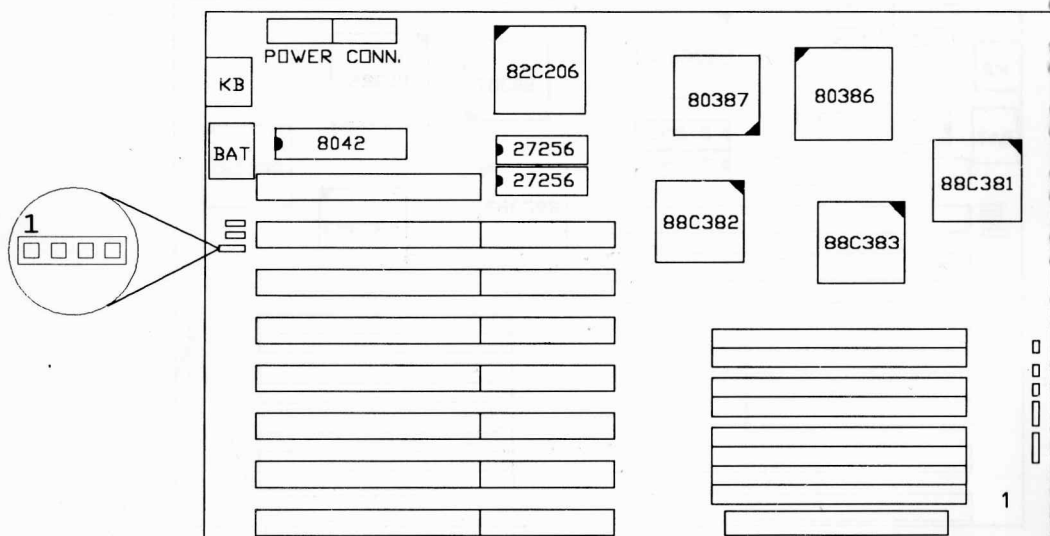


■ Fig. 2-6 TURBOLED location



2-2.7 External Battery Connector (BATTERY)

To maintain the real time clock/calendar and the configuration data in the CMOS memory, connect a 4.5V external battery to the system main board through the connector labeled "BATTERY". Please refer to Figure 2-7 for the location and Table 2-1 for the pin assignments.



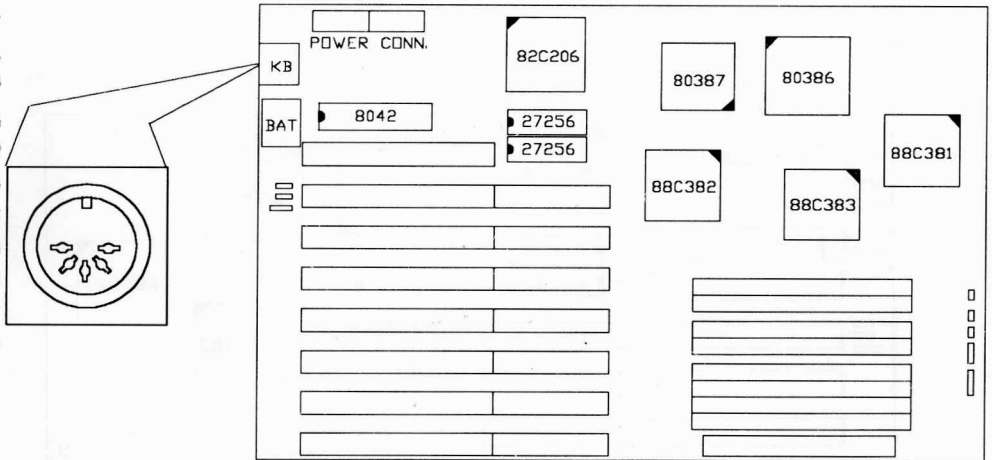
■ Fig. 2-7 J10 location

Pin	Assignment
1	battery "+"
4	ground

■ Tab. 2-1 BATTERY pin assignments

2-2.8 Keyboard Connector (KEYBOARD)

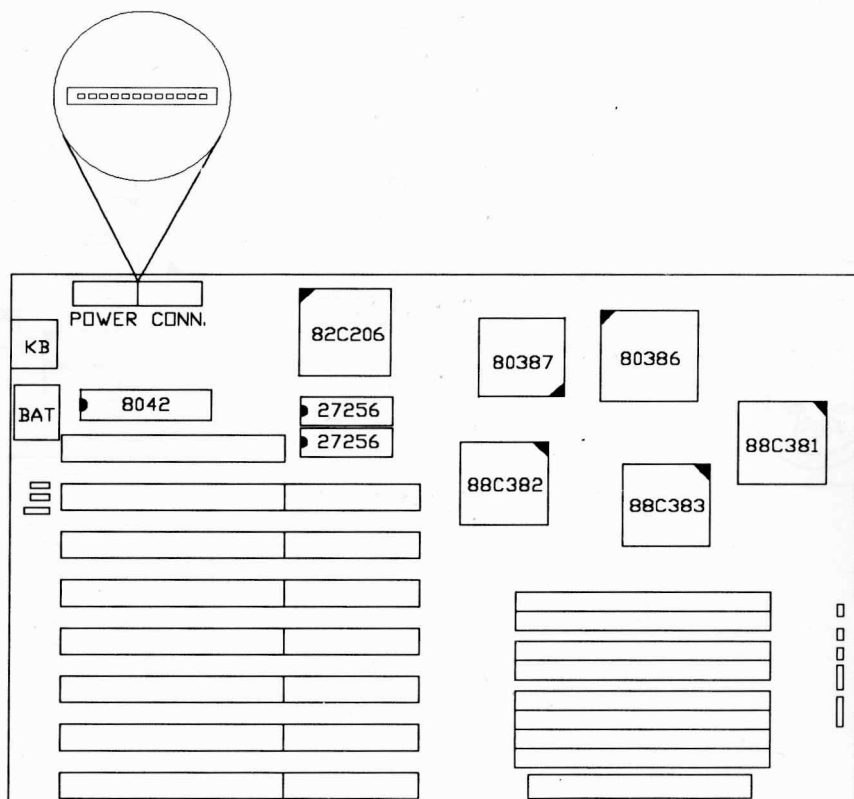
KEYBOARD is a 5-pin keyboard connector. Plug in a PC/AT compatible keyboard for the system. Please refer to Figure 2-8 for the location.



■ Fig. 2-8 KEYBOARD location

2-2.9 Power Supply Connector

The power supply connector is a 12-pin connector. A PC/AT compatible power supply is required to operate the system. And it is very important to have a clean and steady power source to ensure reliable performance. Please refer to Figure 2-9 for the location.



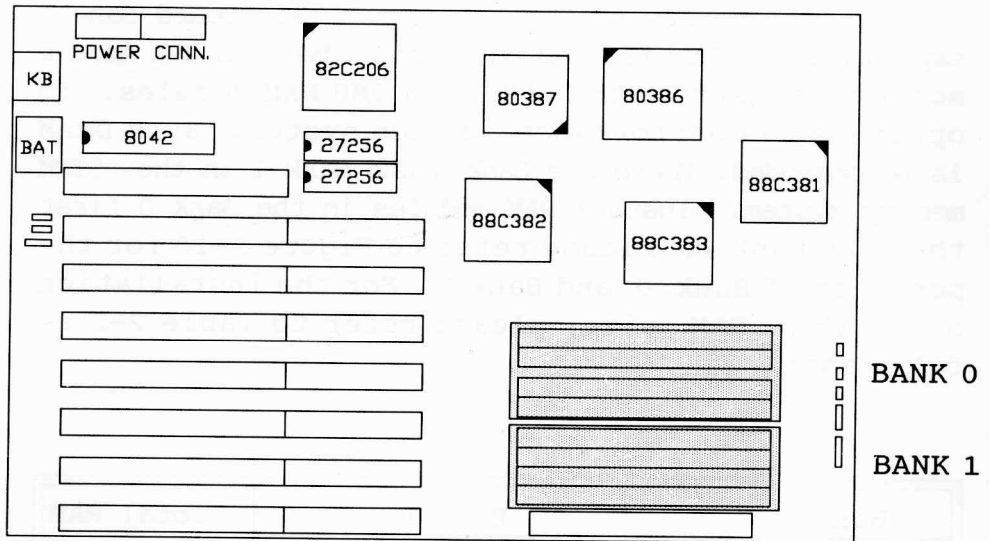
■ Fig. 2-9 power supply connector location

2-3 Main Memory Installation

The main memory of the 386 system main board can be expanded from 1MB to 8MB on board. The SIMM RAM module sockets accept both 256KB and 1MB RAM modules. To optimize the performance of the system, 80ns DRAM is recommended. There are Bank 0 and Bank 1 in the SIMM memory system. Install RAM modules in the Bank 0 first then the Bank 1. Please refer to Figure 2-10 for the position of Bank 0 and Bank 1. For the installation of various RAM size, please refer to Table 2-2 as following:

Bank 0		Bank 1		Total RAM
RAM module	Q'ty	RAM module	Q'ty	
256K	4		None	1M
256K	4	256K	4	2MB
1M	4		None	4MB
1M	4	1M	4	8MB

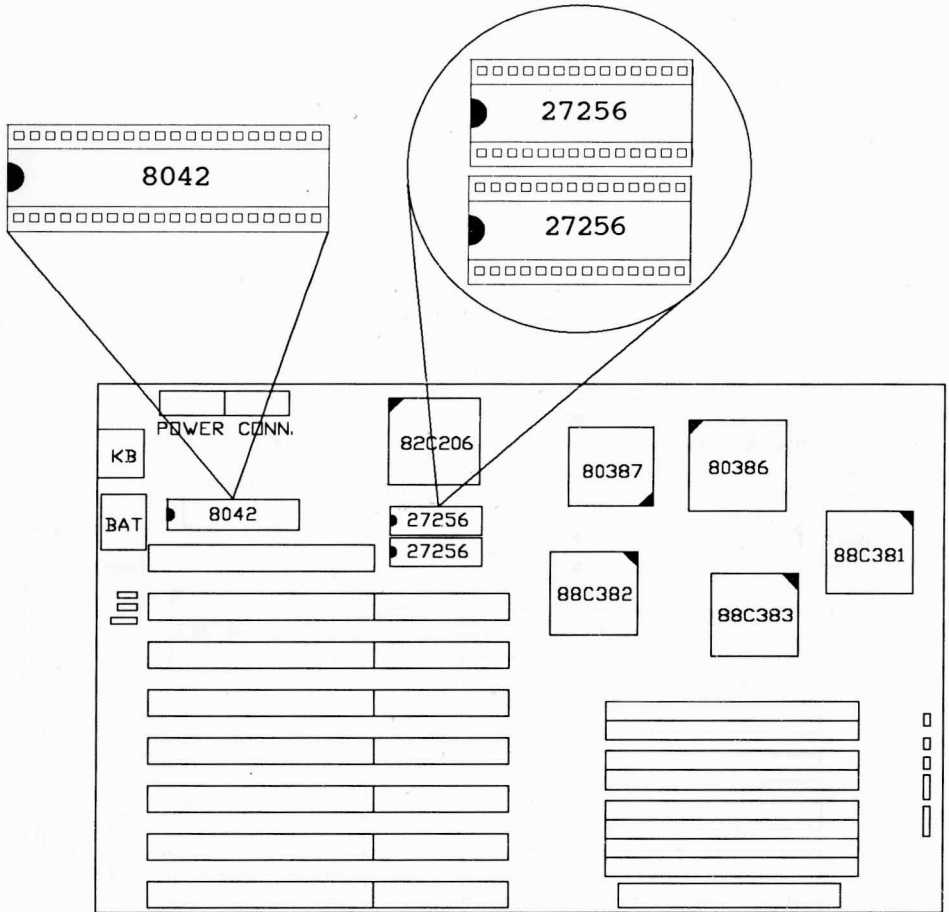
■ Tab. 2-2 RAM installation



■ Fig. 2-10 RAM location

2-4 ROM Installation

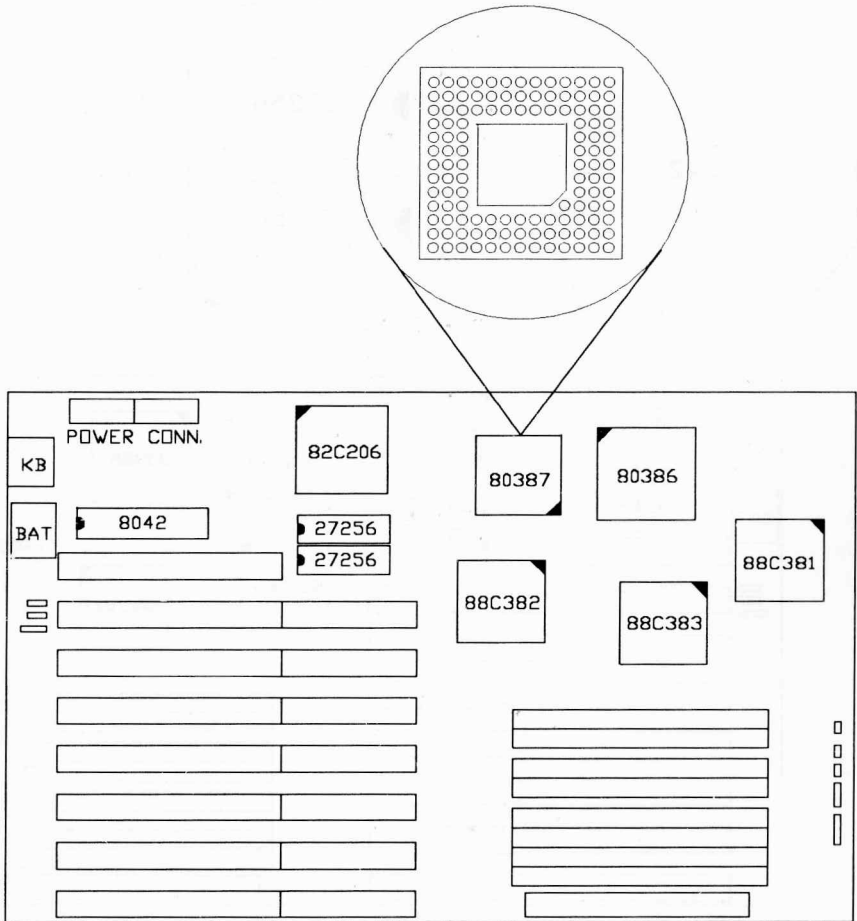
The location U11 and U12 on the system main board is for the installation of the system BIOS ROM chip and the location U5 is for keyboard BIOS. The system BIOS socket accepts 27256 ROM. Figure 2-11 shows locations of these two BIOS.



■ Fig. 2-11 ROM installation

2-5 Co-Processor Installation

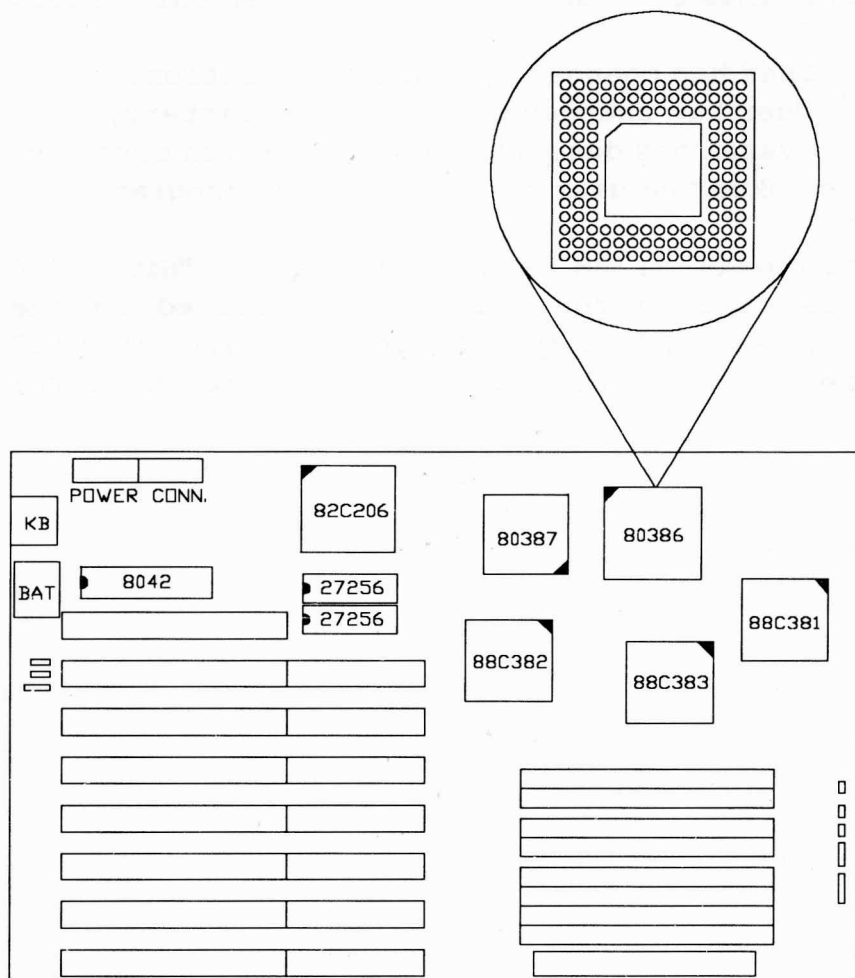
The location U15 is a socket for math co-processor. It accepts both Weitek 3167 and Intel 80387. Plug a math co-processor into this location with appropriate setup will increase the processing speed. Figure 2-12 shows the location of the socket.



■ Fig. 2-12 Co-processor socket

2-6 CPU Installation

The location U22 is a socket for CPU. Insert a 80386-33 or 80386-25 CPU into this socket. Figure 2-13 shows the location of CPU.



■ Fig. 2-13 CPU location

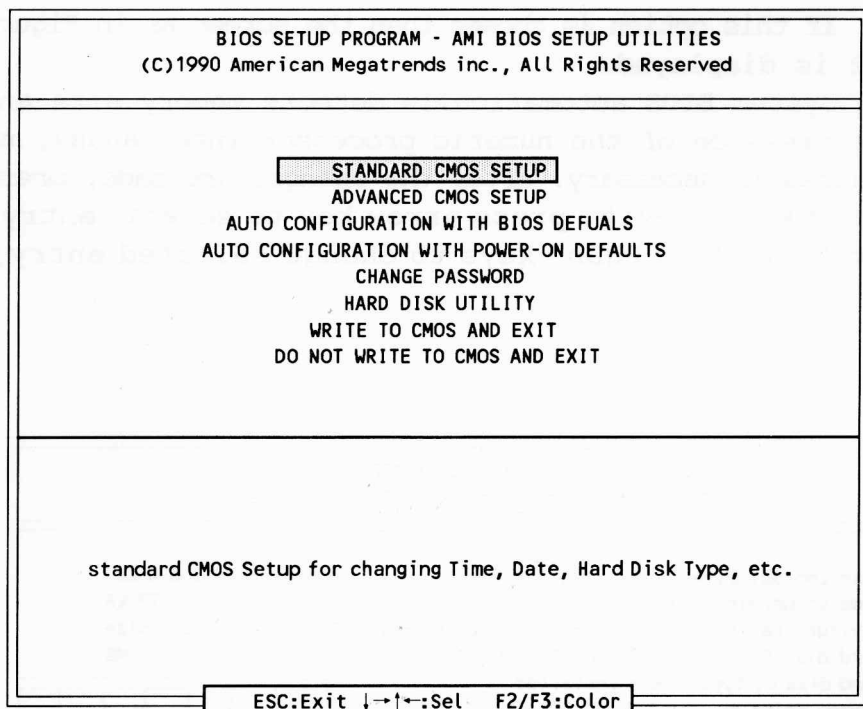
Chapter THREE:SYSTEM SETUP

3-1 Setup System Configuration

A setup program has been built into the system BIOS so the configurations stored in the CMOS RAM can be changed. This program should be executed only after:

- 1) User has changed system configuration,
- 2) User has changed system backup battery, or
- 3) System has detected a configuration error and has asked the user to run the setup program.

After power-on RAM testing, the message: "Hit <ESC> if you want to run SETUP" is displayed on the screen. Press "ESC" to run CMOS setup program. if "ESC" key pressed, the following messages will be displayed:



■ Figure 3-1: Setup Menu Screen

Use arrow keys to select and press "Enter" to run the selected Program.

The setup program is completely menu driven. Use arrow keys to select entry; "F2" / "F3" key to change screen display color, and "ESC" key to exit. Help messages are displayed in a window on the screen.

3-2 RUN CMOS SETUP

If this option is chosen then the screen as in Figure 3-2 is displayed.

System BIOS automatically detects memory size and the presence of the numeric processor Intel 80387, no changes is necessary. After the changes are made, press "ESC" key to exit. press arrow key to select entry; and "PgUp " / "PgDn" keys to change selected entry;

BIOS SETUP PROGRAM - STANDARD CMOS SETUP																																																											
(C)1990 American Megatrends Inc., All Right Reserved																																																											
Date (mn/date/year): Mon, May 01 1989					Base memory : 640 KB																																																						
Time (hour/min/sec): 10 : 06 : 29					Ext. memory : 3072 KB																																																						
Daylight saving : Disable					Cyln	Head	WPcom	LZone	Sect	Size																																																	
Hard disk C: type : 47 = USER TYPE					0	0	0	0	0	0 MB																																																	
Hard disk D: type : Not Installed																																																											
Floppy drive A: : 1.2 MB, 51/4"																																																											
Floppy drive B: : 1.2 MB, 51/4"																																																											
Primary display : VGA/PGA/EGA																																																											
Keyboard : Installed																																																											
					<table border="1"><thead><tr><th>Sun</th><th>Mon</th><th>Tue</th><th>Wed</th><th>Thu</th><th>Fri</th><th>Sat</th></tr></thead><tbody><tr><td>30</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr><tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr><tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td></tr><tr><td>28</td><td>29</td><td>30</td><td>31</td><td>1</td><td>2</td><td>3</td></tr><tr><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr></tbody></table>						Sun	Mon	Tue	Wed	Thu	Fri	Sat	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10
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4	5	6	7	8	9	10																																																					
Month : Jan, Feb Dec Date : 01 02 03,... 31 Year : 1901, 1902,..... 2099																																																											
ESC = Exit, ← :Select F2/F3:Color PU/PD:Modify																																																											

■ Figure 3-2: STANDARD CMOS Setup Screen

3-3 RUN ADVANCE CMOS SETUP

ADVANCE CMOS SETUP program allows user to select special functions such as memory wait state or shadow.

If user want to programming the typematic rate, then enable the function, allow to select typematic rate delay and rate (characts/sec).

If user used WEITEK 1167/3167 Coprocessor to install on system board, must to select Weitek processor to "Present", for normal function operation to work corrected.

Password checking option provides selections of "Disable"; "Setup"; "Always" three operation conditions.

- 1) Disable password check funcation.
- 2) Before user entry the setup program, checking password.
- 3) The system boot and entry the setup program, checking password.

Memory access wait state based on system RAM speed, select 3/2/1 or 0 wait state.

RAM by changing the register value. When selectted, you will see a advance cmos setup program menu screen as in Figure 3-3.

A warning message as in Figure 3-4 is displayed befor entering these setup programs.

BIOS SETUP PROGRAM - ADVANCE CMOS SETUP (C)1990 American Megatrends Inc., All Right Reserved	
Typematic Rate Programming : Disabled Typematic Rate Delay (msec): 250 Typematic Rate (Chars/Sec) : 10.0 Extended Memory Test : Disabled Memory Test Tick Sound : Enabled Memory Parity Error Check : Enabled Hit <ESC> Message Display : Enabled Hard Disk Type 47 RAM Area : 0:300 Wait For <F1>, If Any Error: Enabled System Boot Up Num Lock : On Weitek Processor : Absent Floppy Dive Seek At Boot : Disabled System Boot Up Sequence : C:, A: Fast Gate A20 Option : Enabled Vedio ROM Shadow C000,16k: Enabled Vedio ROM Shadow C400,16k: Enabled Adaptor ROM Shadow C800,16k: Disabled Adaptor ROM Shadow CC00,16k: Disabled	Adaptor ROM Shadow D000,16k: Disabled Adaptor ROM Shadow D400,16k: Disabled Adaptor ROM Shadow D800,16k: Disabled Adaptor ROM Shadow DC00,16k: Disabled Adaptor ROM Shadow E000,16k: Disabled Adaptor ROM Shadow E400,16k: Disabled Adaptor ROM Shadow E800,16k: Disabled Adaptor ROM Shadow EC00,16k: Disabled System ROM Shadow F000,64k: Enabled Password Checking Option : Disabled Bus Clock Selection : PROCLK/6 DMA Clock Selection : SCLK/2 DRAM Access Wait State : 0 W/S
ESC :Exit :Sel (Ctrl)Pu/Pd:Modify F1:Hlep F2/F3:Color F5:Old Values F6:BIOS Setup Defaults F7:Power-On Defaults	

■ Figure 3-3 ADVANCE CMOS SETUP Screen

BIOS SETUP PROGRAM - WARNING INFORMATION
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Improper Use of Setup may Cause Problems !!

If System Hangs, Reboot System and Enter Setup by Pressing the ``ESC'' key

Do any of the following After Entering Setup

- (i) Alter Options to make System Work
- (ii) Load BIOS Setup Defaults
- (iii) Load Power-on Defaults

Hit ``ESC'' to Stop now, any other key to continue

■ Figure 3-4 Warning Information Message Screen

User are not encouraged to run ADVANCE CMOS setup program. Your system should have been fine tuned before shipping. Improper setup may cause the system to fail. Consult your dealer before making any changes.

AUTO CONFIGURATION WITH BIOS DEFAULTS

This auto configuration with BIOS defaults values provides following :

Typematic Rate Programming : Disabled	Adaptor ROM Shadow D000,16k: Disabled
Typematic Rate Delay (msec): 250	Adaptor ROM Shadow D400,16k: Disabled
Typematic Rate (Chars/Sec) : 10.0	Adaptor ROM Shadow D800,16k: Disabled
Extended Memory Test : Disabled	Adaptor ROM Shadow DC00,16k: Disabled
Memory Test Tick Sound : Enabled	Adaptor ROM Shadow E000,16k: Disabled
Memory Parity Error Check : Enabled	Adaptor ROM Shadow E400,16k: Disabled
Hit <ESC> Message Display : Enabled	Adaptor ROM Shadow E800,16k: Disabled
Hard Disk Type 47 RAM Area : 0:300	Adaptor ROM Shadow EC00,16k: Disabled
Wait For <F1>, If Any Error: Enabled	System ROM Shadow F000,64k: Enabled
System Boot Up Num Lock : On	Password Checking Option : Disabled
Weitek Processor : Absent	Bus Clock Selection : PROCLK/6
Floppy Dive Seek At Boot : Disabled	DMA Clock Selection : SCLK/2
System Boot Up Sequence : C:, A:	DRAM Access Wait State : 2 W/S
Fast Gate A20 Option : Enabled	
Vedio ROM Shadow C000,16k: Enabled	
Vedio ROM Shadow C400,16k: Enabled	
Adaptor ROM Shadow C800,16k: Disabled	
Adaptor ROM Shadow CC00,16k: Disabled	

AUTO CONFIGURATION WITH POWER-ON DEFAULTS

This auto configuration with Power-On defaults values provides following :

Typematic Rate Programming : Disabled	Adaptor ROM Shadow D000,16k: Disabled
Typematic Rate Delay (msec): 250	Adaptor ROM Shadow D400,16k: Disabled
Typematic Rate (Chars/Sec) : 10.0	Adaptor ROM Shadow D800,16k: Disabled
Extended Memory Test : Disabled	Adaptor ROM Shadow DC00,16k: Disabled
Memory Test Tick Sound : Enabled	Adaptor ROM Shadow E000,16k: Disabled
Memory Parity Error Check : Disabled	Adaptor ROM Shadow E400,16k: Disabled
Hit <ESC> Message Display : Enabled	Adaptor ROM Shadow E800,16k: Disabled
Hard Disk Type 47 RAM Area : 0:300	Adaptor ROM Shadow EC00,16k: Disabled
Wait For <F1>, If Any Error: Enabled	System ROM Shadow F000,64k: Disabled
System Boot Up Num Lock : On	Password Checking Option : Disabled
Weitek Processor : Absent	Bus Clock Selection : PROCLK/8
Floppy Dive Seek At Boot : Enabled	DMA Clock Selection : SCLK/2
System Boot Up Sequence : A:, C:	DRAM Access Wait State : 3 W/S
Fast Gate A20 Option : Disabled	
Vedio ROM Shadow C000,16k: Disabled	
Vedio ROM Shadow C400,16k: Disabled	
Adaptor ROM Shadow C800,16k: Disabled	
Adaptor ROM Shadow CC00,16k: Disabled	

3-4 CHANGE PASSWORD

Use this BIOS setup program to change user password. Your system have been defaults "Disable" before shipping.

A screen as in Figure 3-5 is displayed if the change password is chosen.

BIOS SETUP PROGRAM - AMI BIOS SETUP UTILITIES
(C)1990 American Megatrends Inc., All Rights Reserved

Enter ROM Password :

Use ASCII Characters Only, ESC:Exit

■ Figure 3-5 Change Password screen

The DEFAULTS ROM PASSWORD is "AMIBIOS", when user enter the password in first time, if keyin "AMIBIOS" <ENTER> is correct, the system allow user to keyin the new password, use ASCII characters only, the keyin new password is not to echo display, the explame described the new password enter, type the "solutions" <ENTER>, the system wanted user Renter NEW Password, then type same word "solutions" <ENTER>, if the renter new password is same as new password, the setup program is to go back to the figure 3-1 Setup Menu screen, change the User Password stored in the CMOS.

HARD DISK UTILITY

If this option is chosen then the screen as in figure 3-6 is displayed.

The hard disk utility has supported the MFM/RLL decoding format type of hard disk drive, including the hard disk low level physical format and hard disk media analysis.

BIOS SETUP PROGRAM - HARD DISK UTILITY						
(C)1990 American Megatrends Inc., All Rights Reserved						
	Cyl	Head	WPcom	LZone	Sect	Size (MB)
Hard Disk c: type : 2	615	4	300	615	17	20
Hard Disk c: type : Not Installed						
Hard Disk Type can be changed from the STANDARD CMOS SETUP option in Main Menu						
Hard Disk Format Auto Interleave Media Analysis						
ESC:Exit ↓↑←→:Sel F2/F3:Color						

■ Figure 3-6 Hard Disk Utility screen

WRITE TO CMOS AND EXIT

Select this option and press "Enter" key after CMOS setup is done to activate the changes. User is prompted "Write to CMOS and EXIT (Y/N) ? N". Press "Y" to save the changes and System reboot. Press "N" to go back to the setup program.

DO NOT WRITE CMOS AND EXIT

When this option is selected and press "Enter" key. User is prompted "Want to Quit Without Saving (Y/N) ? N". Press "Y" to do not write the settings to the CMOS and system reboot. Press "N" to go back to the setup program.

3-5 SYSTEM HANG SAVER

If the system fails due to improper setup, press and hold the < ESC > key, and turn the machine off and then on. Release the < ESC > key after memory test starts. This will reset all the SOLUTIONS Chipset registers to the system defaults.

SYSTEM DEFAULT FOR SS386-25N/SS386-33N

When the system is powered on, memory size along with the memory banks enable. DRAM type is determined automatically by the hardware. Other system configuration registers will contain the default values. Major system configuration default parameters are summarized as the following:

- * Typematic Rate Programming : Disabled
Typematic Rate Delay (msec): 250
Typematic Rate (Chars/Sec) : 10.0
- * Extended Memory Test : Disabled
Memory Test Tick Sound : Enabled
Memory Parity Error Check : Enabled
- * Hit <ESC> Message Display : Enabled
Hard Disk Type 47 RAM Area : 0:300
Wait For <F1>, If Any Error: Enabled
System Boot Up Num Lock : On
- * Weitek Processor : Absent
- * Floppy Dive Seek At Boot : Disabled
System Boot Up Sequence : A:, C:
- * Fast Gate A20 Option : Disabled

- * Vedio ROM Shadow C000,16k: Enabled
- Vedio ROM Shadow C400,16k: Enabled
- Adaptor ROM Shadow C800,16k: Disabled
- Adaptor ROM Shadow CC00,16k: Disabled
- Adaptor ROM Shadow D000,16k: Disabled
- Adaptor ROM Shadow D400,16k: Disabled
- Adaptor ROM Shadow D800,16k: Disabled
- Adaptor ROM Shadow DC00,16k: Disabled
- Adaptor ROM Shadow E000,16k: Disabled
- Adaptor ROM Shadow E400,16k: Disabled
- Adaptor ROM Shadow E800,16k: Disabled
- Adaptor ROM Shadow EC00,16k: Disabled

- * System ROM Shadow F000,64k: Enabled

- * Password Checking Option : Disabled

- * AT Bus Clock Selection (BCLK)
 - For 33MHZ system PROCLK/8= 8.25MHZ
 - For 25MHZ system PROCLK/6= 8.33MHZ

- * DMA Clock Selection (DMACLK)
 - For 33MHZ system BCLK/2 = 4.125MHZ
 - For 25MHZ system BCLK/2 = 4.165MHZ

- * DRAM Access Wait State (DRAM : 80NS)
 - For 33MHZ system : 1 w/s
 - For 25MHZ system : 0 w/s

SYSTEM OPTIMIZATION

The following changes can increase your SS386-25N system performance no matter what hardware configuration/adaptor is used, provided that you use the 80ns DRAM:

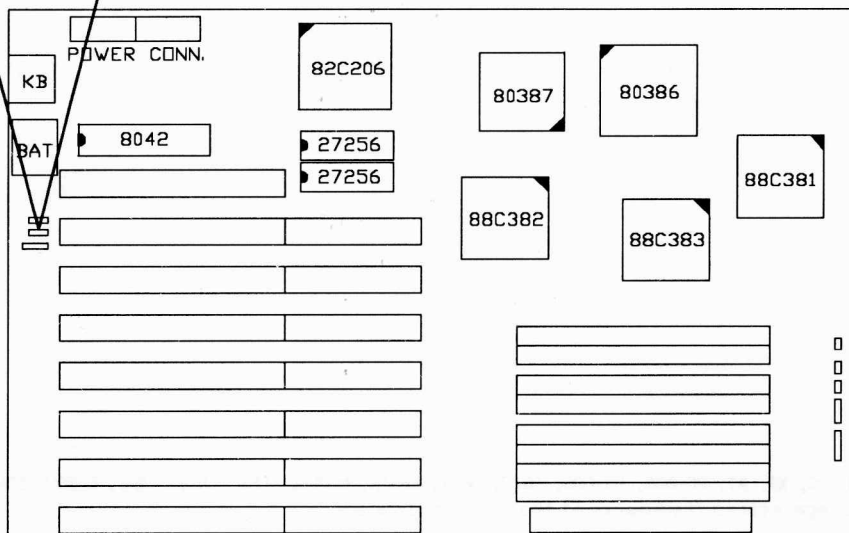
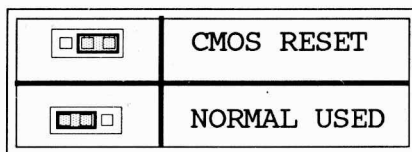
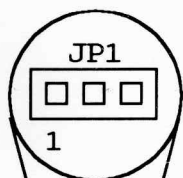
- The JP2 jump is default to Address Pipelined Mode don't change it.
- The Turbo switch is default to the higher clock speed.
- Memory interleave function is default enabled.
- Change RAM access wait state to 0 w/s.
- Shadow Main BIOS, VIDEO BIOS or others in RAM.

The system can be tuned up even better by decreasing the various other wait-states command-delays, and increasing the Bus/DMA clock speed. However, these changes are usually dependent on the adaptor's capability.

3-6 Hardware CMOS Reset

Follow the procedures below to clear the CMOS memory:

1. Turn the system power off.
2. Disconnect the external battery connector (BATTERY).
3. Connect JP1 for CMOS RESET and wait for about one minutes and the CMOS will be cleared.
4. Connect JP1 for normal use again and turn the system on. Run the setup program to set the correct configuration information.



3-7 System Speed Alternation

Software Switch:

The system speed can be switched from keyboard. To select the turbo speed, please hold down <Ctrl> and <Alt> then press <->. To switch back to normal speed, hold down <Ctrl> and <Alt> then press <+> again. Please note that the procedure is based on AMI BIOS. The Turbo Mode is based on the Turbo LED lighting.

Hardware Switch:

Press down the turbo switch on the front panel of the case to select the turbo speed. Press again and release the switch to select the normal speed.

